

DATA CONTROLLED SWITCH FOR TELEPHONE INPUTS TO A COMPUTER

BACKGROUND OF THE INVENTION

In many businesses across the country, a central processing computer will process data input from a number of operator terminals that are connected to the computer via cables. This data is typed into the terminal on its keyboard for input to the computer, and the computer sends data to the terminal for display on the cathode ray tube (CRT) of the terminal. Information may be either fed from many terminals to the central processing computer, or from a central processing computer to the terminals, simultaneously. For example, in a typical system involving a mini-computer as the central processing computer, the mini-computer would operate approximately ten or twelve terminals. In addition to these operator terminal inputs over cables, the mini-computer may have inputs that are received from the telephone lines.

In a typical telephone input for prior systems, the information received from the telephone lines is fed through a data access arrangement (DAA) into a modulator/demodulator (modem) and input to the mini-computer. Typically, the information being fed to the mini-computer over the telephone line is fed into the telephone by a data entry terminal located remote from the mini-computer or even another computer. (The information being received over the telephone line is fed through a DAA due to the Federal Communications Commission (FCC) requirement.) Because the mini-computer has a limited number of inputs, it is desirable to share an input between (1) the operator terminal which inputs data through cable, and (2) the device which inputs data over telephone lines.

In the past, for the mini-computer to share an input, the computer would be switched from the operator terminal to the telephone input received through the modem by using a switch such as a relay or by changing wiring by hand. After transmission, the relay or wiring would be changed to switch the mini-computer back to the operator terminal. In this manner, the information being received from the remote location of the data entry terminal can be received by the mini-computer for validation and processing. The input would then be switched back to the operator terminal so the mini-computer can display on the CRT the results of the transmission. The operator would then be able to make any changes or corrections that would be necessary via the keyboard of the operator terminal. The speed at which this type of operation is completed is of great concern, as well as the differences between computer operating speed and telephone transmission speeds.

For the operation to begin and end in the least amount of time, the switching of the inputs must be done as quickly as possible, preferably by some device more reliable and faster than a relay. Further, in prior switching devices using a relay to switch between the telephone line input and the operator terminal, the switching of the relay had to be done manually. There was no provision for a preprogrammed switch that would switch between the telephone line input and the operator terminal as controlled by a program in the mini-computer, nor based upon signals being received from the data entry terminal.

Most importantly, there was no provision provided in prior systems to compensate for differences between the

speed of the computer and the speed at which data is transferred over telephone lines. That is, prior devices were unable to change the baud (bits per second) rate of the information received over the telephone line input, to the baud rate of the mini-computer; and they were not able to select more than one baud rate for receiving a transmission over telephone lines. This capability is required because the mini-computer works with the operator terminal at a higher baud rate (9600 baud) than the rate at which data is received via telephone lines (usually from 300 to 1200 baud). Any faster baud rate over standard voice-grade/dial-up telephone lines (the least expensive type) is not normally feasible because of interference with random electrical spikes or static noise. Further, the speed-compensation and selectable baud rate are necessary so that the mini-computer will be able to maximize the processing of data received from devices which operate at difference speeds.

Further, in prior systems nothing would prevent data from going from the central processing computer through the modem and DAA, over the phone line to the telephone line input. For obvious security reasons, this is very undesirable.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a data controlled switch that will automatically switch between an operator terminal and a telephone input.

It is another object of the present invention to provide a data controlled solid state switch that will automatically shift between an operator terminal and a telephone input via a data access arrangement and modem upon receiving a predetermined code from a program in a computer.

It is still another object of the present invention to provide a means for automatic operation and verification of information received over telephone lines from remote locations by a keyboard operator at an operator terminal to quickly correct or change any data received over telephone inputs from a data entry terminal at a remote location.

It is yet another object of the present invention to permit the selection of various baud rates at which it is to receive telephone line input, and to increase the rate of transmission of information being received through a telephone input and data entry terminal to a higher rate at which the central processing computer normally operates, thereby enabling the receipt of data from devices which have different operating speeds.

It is another object of the present invention to prevent unauthorized access to any data contained in the central processing computer via telephone line inputs. This is accomplished by changing the baud rate inside the solid state switch for data received from the telephone line input, but not for data received from the central processing computer.

It is even another object of the present invention to provide a highly reliable, fast response, non-manual program controlled switching to switch the central processing computer between the telephone line input and the operator terminal.

The solid state, data controlled switch interfaces between a central processing computer and (1) an operator terminal and/or (2) a data entry terminal received over a telephone line. The operator terminal has an operator display composed of a cathode ray tube (hereinafter referred to as CRT) and a keyboard. The opera-